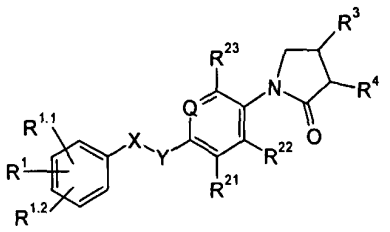
Claims

1. A compound of the formula I



(I)

wherein

Q is =N- or =C(R^{24})-;

X-Y is $-CH_2-CH_2-$, -CH=CH- or $-CH_2-O-$;

R^1, $R^{1.1}$ and $R^{1.2}$ independently from each other are selected from the group consisting of hydrogen, halogen, (C_1-C_6)-alkyl, halogen-(C_1-C_6)-alkyl, cyano, (C_1-C_6)-alkoxy or halogen-(C_1-C_6)-alkoxy;

R^{21}, R^{22} and R^{23} independently from each other are selected from the group consisting of hydrogen and halogen;

R^{24} is hydrogen, halogen or methyl;

R^3 is $-C(O)N(H)CH_3$ or $-CH_2CN$; and

R^4 is hydrogen;

or an individual isomer or racemic or non-racemic mixture thereof.

2. A compound according to claim 1 wherein Q is =C(R^{24})-.

3. A compound according to claim 2 wherein –X-Y- is $-CH_2-O-$; R^1, $R^{1.1}$, and $R^{1.2}$ independently are selected from the group consisting of hydrogen, halogen, methyl, halogenmethyl, cyano, methoxy, and halogenmethoxy; R^{21}, R^{22}, and R^{23} are hydrogen; and R^3 is $-C(O)N(H)CH_3$.

4. A compound according to claim 1 wherein Q is =N-.

5. A compound of claim 1 wherein X-Y is $-CH_2-O-$.

6. A compound according to claim 1 wherein R^3 is $-C(O)N(H)CH_3$.

7. A compound according to claim 1 wherein R^3 is CH_2CN.

8. A compound according to claim 1 wherein X-Y is $-CH_2-CH_2-$ or $-CH=CH-$.

9. A compound according to claim 1 wherein R^{21}, R^{22}, and R^{23} are hydrogen.

10. A compound according to claim 1 wherein R^{21} and R^{23} are hydrogen and R^{22} is fluoro.

11. A compound according to claim 1 wherein Q is =CH-, =CF-, or $=C(CH_3)-$.

12. A compound according to claim 11 wherein Q is =CH-; X-Y is CH_2-O-; R^{21}, R^{22}, and R^{23} are hydrogen; and R^3 is $-C(O)N(H)CH_3$.

13. A compound according to claim 12 wherein R^1, $R^{1.1}$, and $R^{1.2}$ independently are selected from the group consisting of hydrogen, halogen, methyl, halogenmethyl, cyano, methoxy, and halogenmethoxy.

14. A compound according to claim 12 wherein $R^{1.1}$ and $R^{1.2}$ are hydrogen and R^1 is selected from fluoro, chloro, halogenmethyl, cyano, methoxy, and halogenmethoxy.

15. A compound according to claim 1 wherein R^1, $R^{1.1}$ and $R^{1.2}$ independently from each other are selected from the group consisting of hydrogen, halogen, methyl, halogenmethyl, cyano, methoxy or halogen-methoxy.

16. A compound according to claim 1 wherein R^1, $R^{1.1}$, and $R^{1.2}$ are halogen.

17. A compound according to claim 16 wherein R^1, $R^{1.1}$, and $R^{1.2}$ are fluoro.

18. A compound according to claim 17 wherein R^1, $R^{1.1}$, and $R^{1.2}$ are 2,4,6-trifluoro; 2,4,5-trifluoro; 2,3,6-trifluoro; 2,3,4-trifluoro; or 3,4,5-trifluoro.

19. A compound according to claim 1 wherein $R^{1.2}$ is hydrogen and R^1 and $R^{1.1}$ independently from each other are selected from the group consisting of hydrogen, halogen, cyano, $(C_1$-$C_6)$-alkyl, halogen-$(C_1$-$C_6)$-alkyl, $(C_1$-$C_6)$-alkoxy or halogen-$(C_1$-$C_6)$-alkoxy.

20. A compound according to claim 19 wherein R^1 and $R^{1.1}$ independently are halogen or $(C_1$-$C_6)$-alkyl.

21. A compound according to claim 20 wherein $R^{1.1}$ is halogen and R^1 is halogen or $(C_1$-$C_6)$-alkyl.

22. A compound according to claim 1 wherein R^1, $R^{1.1}$, and $R^{1.2}$ are hydrogen.

23. A compound according to claim 1 wherein $R^{1.1}$ and $R^{1.2}$ are hydrogen and R^1 is selected from halogen, cyano, $(C_1$-$C_6)$-alkyl, halogen-$(C_1$-$C_6)$-alkyl, $(C_1$-$C_6)$-alkoxy or halogen-$(C_1$-$C_6)$-alkoxy.

24. A compound according to claim 23 wherein R^1 is halogen, methyl, halogenmethyl, cyano, methoxy, and halogenmethoxy.

25. A compound according to claim 24 wherein R^1 is fluoro.

26. A compound according to claim 25 wherein R^1 is 3-fluoro or 4-fluoro.

27. A compound according to claim 24 wherein R^1 is chloro.

28. A compound according to claim 27 wherein R^1 is 3-chloro.

29. A compound according to claim 24 wherein R^1 is halogenmethyl.

30. A compound according to claim 29 wherein R^1 is 3-trifluoromethyl.

31. A compound according to claim 24 wherein R^1 is cyano.

32. A compound according to claim 24 wherein R^1 is methoxy.

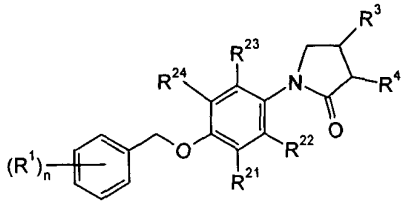
33. A compound according to claim 32 wherein R^1 is 2-methoxy, 3-methoxy, or 4-methoxy.

34. A compound according to claim 24 wherein R^1 is halogenmethoxy.

35. A compound according to claim 34 wherein R^1 is 3-trifluoromethoxy.

36. A compound according to claim 1 wherein the compound has (R)-configuration.

37. A compound of the formula I*



(I*)

wherein

R^1 is halogen, halogen-(C_1-C_6)-alkyl, cyano, (C_1-C_6)-alkoxy or halogen-(C_1-C_6)-alkoxy;

R^{21}, R^{22}, R^{23} and R^{24} independently from each other are selected from the group consisting of hydrogen and halogen;

R^3 is $-CONHR^5$, $-CH_2CN$ or $-CN$;

R^4 is hydrogen;

R^5 is methyl; and

n is 0, 1, 2 or 3;

as well as individual isomers, racemic or non-racemic mixtures thereof.

38. A compound according to claim 37 wherein R^3 is $-C(O)N(H)CH_3$.

39. A compound according to claim 37 wherein R^3 is CH_2CN and R^4 is hydrogen.

40. A compound according to claim 37 wherein n is 1 or 2.

41. A compound according to claim 37 wherein R^1 is halogen or halogen (C_1-C_6)-alkyl.

42. A compound according to claim 41 wherein R^1 is fluoro, chloro, or trifluoromethyl.

43. A compound selected from the group consisting of
(RS)-1-[4-(3-fluoro-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-[1-[4-(4-fluoro-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-1-[4-(3-chloro-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-[1-[4-(3,4-difluoro-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-[1-[4-(2,6-difluoro-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-5-oxo-1-[4-(2,4,6-trifluoro-benzyloxy)-phenyl]-pyrrolidine-3-carboxylic acid methylamide,

(RS)-5-oxo-1-[4-(2,4,5-trifluoro-benzyloxy)-phenyl]-pyrrolidine-3-carboxylic acid methylamide,
(RS)-5-oxo-1-[4-(2,3,6-trifluoro-benzyloxy)-phenyl]-pyrrolidine-3-carboxylic acid methylamide,
(RS)-5-oxo-1-[4-(2,3,4-trifluoro-benzyloxy)-phenyl]-pyrrolidine-3-carboxylic acid methylamide, and
(RS)-5-oxo-1-[4-(3,4,5-trifluoro-benzyloxy)-phenyl]-pyrrolidine-3-carboxylic acid methylamide.

44. A compound selected from the group consisting of
(RS)-1-[4-(5-fluoro-2-methyl-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-1-[4-(3-methoxy-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-1-[4-(2-methoxy-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-5-oxo-1-[4-(3-trifluoromethoxy-benzyloxy)-phenyl]-pyrrolidine-3-carboxylic acid methylamide,
(RS)-5-oxo-1-[4-(3-trifluoromethyl-benzyloxy)-phenyl]-pyrrolidine-3-carboxylic acid methylamide,
(RS)-1-[4-(3-cyano-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-1-[4-(3-fluoro-benzyloxy)-3-methyl-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-1-[4-(4-fluoro-benzyloxy)-3-methyl-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-1-[4-(3-chloro-benzyloxy)-3-methyl-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-1-[3-fluoro-4-(3-fluoro-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide,

(RS)-1-[2-fluoro-4-(3-fluoro-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide, and
(RS)-1-[2,5-difluoro-4-(3-fluoro-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide.

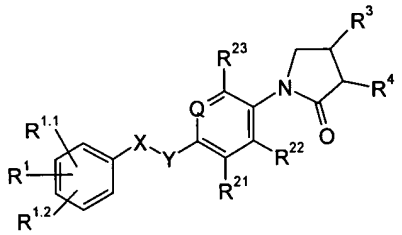
45. A compound selected from the group consisting of
(RS)-1-(4-benzyloxy-phenyl)-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(R)-1-[4-(3-fluoro-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(S)-1-[4-(3-fluoro-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(R)-1-(4-benzyloxy-phenyl)-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(S)-1-(4-benzyloxy-phenyl)-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(R)-1-[4-(4-fluoro-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(R)-1-[4-(3-fluoro-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(R)-1-[4-(3-chloro-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide, and
(R)-1-[4-(2,6-difluoro-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide.

46. A compound selected from the group consisting of
(R)-5-oxo-1-[4-(2,4,6-trifluoro-benzyloxy)-phenyl]-pyrrolidine-3-carboxylic acid methylamide,
(RS)-1-[4-(3,4-difluoro-benzyloxy)-phenyl]-5-oxo-pyrrolidin-3-yl}-acetonitrile,
(RS)-{1-[4-(3-fluoro-benzyloxy)-phenyl]-5-oxo-pyrrolidin-3-yl}-acetonitrile,
(RS)-[1-(4-benzyloxy-phenyl)-5-oxo-pyrrolidin-3-yl]-acetonitrile,
(RS)-(E)-1-{4-[2-(3-fluoro-phenyl)-vinyl]-phenyl}-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-(E)-1-{4-[2-(4-methoxy-phenyl)-vinyl]-phenyl}-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-(E)-1-{4-[2-(3-methoxy-phenyl)-vinyl]-phenyl}-5-oxo-pyrrolidine-3-carboxylic acid methylamide, and

(RS)-(E)-1-{4-[2-(4-fluoro-phenyl)-vinyl]-phenyl}-5-oxo-pyrrolidine-3-carboxylic acid methylamide.

47. A compound selected from the group consisting of
(RS)-1-{4-[2-(3-chloro-phenyl)-ethyl]-phenyl}-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-1-{4-[2-(4-chloro-phenyl)-ethyl]-phenyl}-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-1-{4-[2-(3-fluoro-phenyl)-ethyl]-phenyl}-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-1-{4-[2-(4-fluoro-phenyl)-ethyl]-phenyl}-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-1-{4-[2-(3-methoxy-phenyl)-ethyl]-phenyl}-5-oxo-pyrrolidine-3-carboxylic acid methylamide,
(RS)-1-[6-(4-fluoro-benzyloxy)-pyridin-3-yl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide, and
(RS)-1-[4-(2-fluoro-benzyloxy)-phenyl]-5-oxo-pyrrolidine-3-carboxylic acid methylamide.

48. A composition comprising a compound of formula I



(I)

wherein

Q is =N- or =C(R^{24})-;

X-Y is $-CH_2-CH_2-$, -CH=CH- or $-CH_2-O-$;

R^1, $R^{1.1}$ and $R^{1.2}$ independently from each other are selected from the group consisting of hydrogen, halogen, (C_1-C_6)-alkyl, halogen-(C_1-C_6)-alkyl, cyano, (C_1-C_6)-alkoxy or halogen-(C_1-C_6)-alkoxy;

R^{21}, R^{22} and R^{23} independently from each other are selected from the group consisting of hydrogen and halogen;

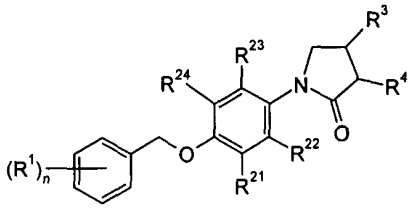
R^{24} is hydrogen, halogen or methyl;

R^3 is $-C(O)N(H)CH_3$ or $-CH_2CN$; and

R^4 is hydrogen;

or an individual isomer or racemic or non-racemic mixture thereof, and a pharmaceutically acceptable carrier.

49. A composition comprising a compound of formula I*



(I*)

wherein

R^1 is halogen, halogen-(C_1-C_6)-alkyl, cyano, (C_1-C_6)-alkoxy or halogen-(C_1-C_6)-alkoxy;

R^{21}, R^{22}, R^{23} and R^{24} independently from each other are selected from the group consisting of hydrogen and halogen;

R^3 is $-CONHR^5$, $-CH_2CN$ or $-CN$;

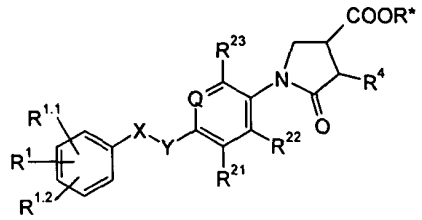
R^4 is hydrogen;

R^5 is methyl; and

n is 0, 1, 2 or 3;

or an individual isomer or racemic or non-racemic mixture thereof, and a pharmaceutically acceptable carrier.

50. A process for the preparation of compounds of formula I according to claim 1 wherein R^3 is $-C(O)N(H)CH_3$ comprising reacting a compound of formula II

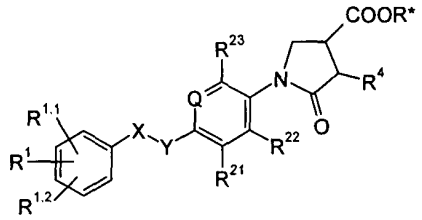


(II)

wherein R^1, $R^{1.1}$, $R^{1.2}$, R^{21}, R^{22}, R^{23}, R^4, -X-Y- and Q have the meanings as defined in claim 1 and R* is hydrogen or (C_1-C_6)-alkyl

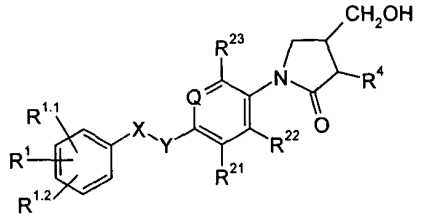
with an amine of formula H_2N-R^5, wherein R^5 has the meaning as defined in claim 1.,

51. A process for the preparation of compounds of formula I according to claim 1 wherein R^3 is CH_2CN comprising reducing a compound of formula II



(II)

wherein R^1, $R^{1.1}$, $R^{1.2}$, R^{21}, R^{22}, R^{23}, R^4, -X-Y- and Q have the meanings as defined in claim 1 and R* is hydrogen or (C_1-C_6)-alkyl to a compound of formula III



(III)

wherein R^1, $R^{1.1}$, $R^{1.2}$, R^{21}, R^{22}, R^{23}, R^4, -X-Y- and Q have the meanings as defined in claim 1,

and reacting the compound of formula III with a cyanide salt.

52. A method for the treatment of Alzheimer's disease comprising administering to an individual a therapeutically effective amount of a compound of claim 1.

53. A method for the treatment of senile dementia comprising administering to an individual a therapeutically effective amount of a compound of claim 1.